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Se June Hong

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07/20/2004

EXAMINER

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ART UNIT

PAPER NUMBER

3622

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/773,809

Applicant(s)

HONG ET AL.

Examiner

Jean D Janvier

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 May 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 9-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 9-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

Response To Applicant's Amendments

In response to the Applicant's amendments and arguments, the Examiner will examine claims 1 and 9-14 together as they now stand in the Application.

Detailed Action

Specification

The title of the invention, under 37 CFR 1.72, should be brief, descriptive and technically accurate.

Status of the claims

Claims 1 and 9-14 are currently pending in the Application following a restriction requirement and claims 3-8 are canceled.

Claim Objections

Claims 11-12 are objected to because of the following informalities:

Concerning claims 11-12, the limits of the letter k should be defined.

Appropriate correction is required.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

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Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

As an initial matter, the United States Constitution under Art. I, §8, cl. 8 gave Congress the power to "[p]romote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries". In carrying out this power, Congress authorized under 35 U.S.C. §101 a grant of a patent to "[w]hoever invents or discovers any new and useful process, machine, manufacture, or composition or matter, or any new and useful improvement thereof." Therefore, a fundamental premise is that a patent is a statutorily created vehicle for Congress to confer an exclusive right to the inventors for "inventions" that promote the progress of "science and the useful arts". The phrase "technological arts" has been created and used by the courts to offer another view of the term "useful arts". See *In re Musgrave*, 167 USPQ (BNA) 280 (CCPA 1970). Hence, the first test of whether an invention is eligible for a patent is to determine if the invention is within the "technological arts".

Further, despite the express language of §101, several judicially created exceptions have been established to exclude certain subject matter as being patentable subject matter covered by §101. These exceptions include "laws of nature", "natural phenomena", and "abstract ideas". See *Diamond v. Diehr*, 450, U.S. 175, 185, 209 USPQ (BNA) 1, 7 (1981). However, courts have found that even if an invention incorporates abstract ideas, such as mathematical algorithms, the invention may nevertheless be statutory subject matter if the invention as a whole produces a "useful, concrete and tangible result." See *State Street Bank & Trust Co. v. Signature Financial Group, Inc.* 149 F.3d 1368, 1973, 47 USPQ2d (BNA) 1596 (Fed. Cir. 1998).

This "two prong" test was evident when the Court of Customs and Patent Appeals (CCPA) decided an appeal from the Board of Patent Appeals and Interferences (BPAI). See *In re Toma*, 197 USPQ (BNA) 852 (CCPA 1978). In *Toma*, the court held that the recited mathematical algorithm did not render the claim as a whole non-statutory using the Freeman-Walter-Abele test as applied to *Gottschalk v. Benson*, 409 U.S. 63, 175 USPQ (BNA) 673 (1972). Additionally, the court decided separately on the issue of the "technological arts". The court developed a "technological arts" analysis:

The "technological" or "useful" arts inquiry must focus on whether the claimed subject matter...is statutory, not on whether the product of the claimed subject matter...is statutory, not on whether the prior art which the claimed subject matter purports to replace...is statutory, and not on whether the claimed subject matter is presently perceived to be an improvement over the prior art, e.g., whether it "enhances" the operation of a machine. *In re Toma* at 857.

In *Toma*, the claimed invention was a computer program for translating a source human language (e.g., Russian) into a target human language (e.g., English). The court found that the claimed computer implemented process was within the "technological art" because the claimed invention was an operation being performed by a computer within a computer.

The decision in *State Street Bank & Trust Co. v. Signature Financial Group, Inc.* never addressed this prong of the test. In *State Street Bank & Trust Co.*, the court found that the "mathematical exception" using the Freeman-Walter-Abele test has little, if any, application to determining the presence of statutory subject matter but rather, statutory subject matter should be

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based on whether the operation produces a "useful, concrete and tangible result". See *State Street Bank & Trust Co.* at 1374. Furthermore, the court found that there was no "business method exception" since the court decisions that purported to create such exceptions were based on novelty or lack of enablement issues and not on statutory grounds. Therefore, the court held that "[w]hether the patent's claims are too broad to be patentable is not to be judged under §101, but rather under §§102, 103 and 112." See *State Street Bank & Trust Co.* at 1377. Both of these analysis goes towards whether the claimed invention is non-statutory because of the presence of an abstract idea. Indeed, *State Street* abolished the Freeman-Walter-Abele test used in *Toma*. However, *State Street* never addressed the second part of the analysis, i.e., the "technological arts" test established in *Toma* because the invention in *State Street* (i.e., a computerized system for determining the year-end income, expense, and capital gain or loss for the portfolio) was already determined to be within the technological arts under the *Toma* test. This dichotomy has been recently acknowledged by the Board of Patent Appeals and Interferences (BPAI) in affirming a §101 rejection finding the claimed invention to be non-statutory. See *Ex parte Bowman*, 61 USPQ2d (BNA) 1669 (BdPatApp&Int 2001).

Claims 1 and 9 (including its dependent claims 10-14) are rejected under 35 U.S.C. 101 because the claimed invention is directed to a **non-statutory subject matter**. In fact, the process or steps disclosed in independent claims 1 and 9 pertains to a manual process and therefore, the claims do not fall within the technological art. In other words, the steps or process of **generating a matrix..., determining preferences..., making prioritized recommendations of items...** as recited in claim 1, should be implemented via a device, such as a computer system, a database, a

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data communication, computer network, the Internet and so and so forth. The same remarks hold true for claims 9-14.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1 and 9-10 are rejected under 35 U.S.C. 102(e) as being anticipated by Linden ,
US Patent 6, 266, 649B1.

As per claims 1 and 9-10, Linden discloses a recommendation service for generating personalized recommendations of items **to at least** one user based on the collective interest (preference) of a community of users, wherein the recommended items are identified using a previously created table (matrix) or other mapping structure (database file storing products previously purchased by customers), which maps individual items to lists of “similar” items” (establishing a profile database or memory containing items previously purchased by other users) and wherein the items similarities as reflected by the table are based at least upon correlation between the interests of users in particular items (establishing users' preferences for particular items).

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In one specific embodiment, Linden discloses that one or more items (comparable or similar items or products) are recommended to a user by the recommendation service during a current transaction based on one or more items (reference items or products) selected by the user. For instance, if the user has currently three items or products (reference items or products) in his shopping cart or market basket, then these three items (reference products) are treated for purpose of generating recommendations as being of interest to the user. In this case, the recommendations may be generated and automatically displayed to the user when the user views his shopping cart contents before he proceeds to the checkout (making priority recommendations). In the above example, if the user is currently searching for books on a particular topic and has added several such books (reference products) in his shopping cart, the service is then operable to produce or recommend other books (comparable or recommended products) involving or covering the same or similar topic or subject matter of interest (Here, searching for reference products or books on a particular topic of interest and retrieving a list of advertised and similar books and recommending one or more comparable or similar products or books to the user, during a transaction, in response to the search are being treated or interpreted as priority recommendations- See abstract; col. 2: 33 to col. 3: 6; col. 3: 38-67; col. 6: 26-67; col. 16: 1-58; figs 1, 3 and 7). Through this process, a list of recommended items (comparable or similar product list combination) is being generated and incorporated into one or more web pages that are returned to the user, wherein each recommended or comparable item is being presented as a hypertextual link to the item's product information page (col. 11: 47-56).

In summary, one or more products are recommended to a given user based on their similarities, as read from a similar items table (generated matrix) 60 or database, to one or

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more identified products known, as read from the user's purchase **history**, to be of interest to the given user. Indeed, the product recommendations are generated using the table 60, which maps identified (popular) items to lists of similar items (similar items list). For example, three identified items are said to be of **interest** to the customer because he recently bought these three items as revealed by his purchase history stored in a database. The recommendation service may search and retrieve the similar item lists (product combination list) from the similar items table 60 for the three known or identified items and appropriately combine these lists to generate item recommendations or a combination of products associated with the known or identified items related to the user's purchase history (col. 48-56). See in general col. 2: 33-45; col. 2: 57-64; col. 3: 1-18; col. 3: 38-56; col. 5: 58 to col. 6: 5 and col. 6: 14-25.

Additionally, the data stored in the database for each user may comprise, among other things, the user's purchase history including dates of particular purchases (col. 7: 24-31). The service generates personal recommendations based upon information stored within the similar items table 60 and based upon identified items known to be of interest to the particular user, wherein these known items are selected from one or more items from the user's purchase history (col. 8: 26-34; col. 10: 47-63). For each identified item known to be of interest to the user, the service retrieves a list of similar items from the similar items table because people who buy the known or identified (popular items) items always purchase these similar items (consumption combination listing) (col. 10: 64-66; figs. 2, 3, 4, 5, 7).

Finally, and in general, Linden teaches a recommendations service for recommending items to individual users based on a set of items that are known to be of interest to the user, such as a set of items previously purchased by the user (based on statistics collected on preference

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information associated with the users). In the disclosed embodiments, the service is used to recommend products to users of a merchant's Web site. The service generates the recommendations using a previously-generated table (matrix), which maps items to lists of "similar" items. The similarities reflected by the table are based on the collective interests of the community of users. For example, in one embodiment, the similarities are based on correlations between the purchases of items by users (e.g., items A and B are similar because a relatively large portion of the users that purchased item A also bought item B). The table also includes scores (correlation or similarity statistics or scores), which indicate degrees of similarity between individual items. To generate personal recommendations, the service retrieves from the table the similar items lists corresponding to the items known to be of interest to the user. These similar items lists are appropriately combined into a single list, which is then sorted or prioritized (based on combined similarity scores or statistical values) and filtered to generate a list of recommended items. Also disclosed are various methods for using the current and/or past contents of a user's electronic shopping cart to generate recommendations (real-time recommendation). In one embodiment, the user can create multiple shopping carts, and can use the recommendation service to obtain recommendations that are specific to a designated shopping cart. In another embodiment, the recommendations are generated based on the current contents of a user's shopping cart, so that the recommendations tend to correspond to the current shopping task being performed by the user (See abstract; figs. 2, 3, 4, 5, 7).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Linden et al. (hereinafter Linden), US Patent 6, 266, 649B1.

As per claims 11-14, Linden teaches a recommendations service for recommending items to individual users based on a set of items that are known to be of interest to the user, such as a set of items previously purchased by the user (based on statistics collected on preference information associated with the users). In the disclosed embodiments, the service is used to recommend products to users of a merchant's Web site. The service generates the recommendations using a previously-generated table (matrix), which maps items to lists of "similar" items. The similarities reflected by the table are based on the collective interests of the community of users. For example, in one embodiment, the similarities are based on correlations between the purchases of items by users (e.g., items A and B are similar because a relatively large portion of the users that purchased item A also bought item B). The table also includes scores (correlation or similarity statistics or scores), which indicate degrees of similarity between individual items. To generate personal recommendations, the service retrieves from the table the similar items lists corresponding to the items known to be of interest to the user. These similar items lists are appropriately combined into a single list, which is then sorted or prioritized (based on combined similarity scores or statistical values) and filtered to generate a list of recommended items. Also disclosed are various methods for using the current and/or past contents of a user's electronic shopping cart to generate recommendations (real-time recommendation). In one

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embodiment, the user can create multiple shopping carts, and can use the recommendation service to obtain recommendations that are specific to a designated shopping cart. In another embodiment, the recommendations are generated based on the current contents of a user's shopping cart, so that the recommendations tend to correspond to the current shopping task being performed by the user (See abstract; figs. 2, 3, 4, 5, 7).

Furthermore, Linden discloses that in step 110, the process generates the commonality indexes for each (popular item, other item) pair in the table 108A of fig. 3. As indicated above, **the commonality index (CI) values are measures of the similarity between two items, with larger CI values indicating greater degrees of similarity (and hence a higher probability or likelihood that the customer the similar item(s)).** The commonality indexes are preferably generated such that, for a given popular_item, the respective commonality indexes of the corresponding other_items take into consideration both (a) the number of customers that are common to both items, and (b) the total number of customers of the other_item. A preferred method for generating the commonality index values is set forth in the equation below:

TABLE 1-

for each popular_item, for each customer in customers of item, for each other_item in items of customer, **increment common-customer-count** (popular_item, other_item)

Moreover, FIG. 4 illustrates this method in example form. In the FIG. 4 example, item_P (a popular item) has two "other items," item_X and item_Y. Item_P has been purchased by 300 customers, item_X by 300 customers, and item_Y by 30,000 customers. In addition, item_P and

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item_X have 20 customers in common, and item_P and item_Y have 25 customers in common.

Applying the equation above to the values shown in FIG. 4 produces the following results:

$$(1) \text{CI}(\text{item_P}, \text{item_X}) = 20 / \sqrt{300 \cdot 300} = 0.0667$$

$$(2) \text{CI}(\text{item_P}, \text{item_Y}) = 25 / \sqrt{300 \cdot 30,000} = 0.0083$$

Thus, even though items P and Y have more customers in common than items P and X, items P and X are treated as being more similar than items P and Y. This result desirably reflects the fact that the percentage of item_X customers that bought item_P (6.7%) is much greater than the percentage of item_Y customers that bought item_P (0.08%).

Because this equation is symmetrical (i.e., $\text{CI}(\text{item_A}, \text{item_B}) = \text{CI}(\text{item_B}, \text{item_A})$), it is not necessary to separately calculate the CI value for every location in the table 108A. In other embodiments, an asymmetrical method may be used to generate the CI values. For example, the CI value for a (popular_item, other_item) pair could be generated as (customers of popular_item and other_item)/(customers of other_item).

Following step 110 of FIG. 3, each popular item has a respective "other_items" list which includes all of the other_items from the table 108A and their associated CI values. In step 112, each other_items list is sorted from highest-to-lowest commonality index. Using the FIG. 4 values as an example, item_X would be positioned closer to the top (priority item) of the item_B's list than item_Y, since $0.014907 > 0.001643$.

In step 114, the sorted other_items lists are filtered by deleting all list entries that have fewer than 3 customers in common. For example, in the other_items list for POPULAR_A in

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table 108A, ITEM_A would be deleted since POPULAR_A and ITEM_A have only two customers in common. Deleting such entries tends to reduce statistically poor correlations between item sales. In step 116, the sorted other_items lists are truncated to length N to generate the similar items lists, and the similar items lists are stored in a B-tree table structure for efficient look-up

Finally, as indicated above, any of a variety of other methods for evaluating similarities between items could be incorporated into the table generation process 66. For example, the table generation process could compare item contents and/or use previously-assigned product categorizations as additional indicators of item similarities. An important benefit of the FIG. 3 method, however, is that the items need not contain any content that is amenable to feature extraction techniques, and need not be pre-assigned to any categories. For example, the method can be used to generate a similar items table given nothing more than the product IDs of a set of products and user purchase histories with respect to these products.

See col. 12: 61 to col. 14: 3; figs. 2, 3, 4, 5 and 7.

Here, although Linden discloses a series of equations to compute common indexes (CI) related to items similarities, he does not, however, express disclose the different equations disclosed in claims 11-14.

However, once a method or process for performing a particular task or a series of tasks is described or defined, one skilled in the art of computer programming, for example, could write up a series of computer codes (Software), which, when executed on a processor, helps automate the defined process. Further, anyone having the proper skills in the art of mathematics could

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derive from the defined process a sequence of mathematical equations, which sum up or simplify the process. These findings or conclusions are well within the level of skills of an ordinary artisan.

Therefore, an ordinary skilled artisan, exposed to the system of Linden, would have been motivated at the time of the invention to include other types of mathematical equations or formulae, besides the equation used to compute the common indexes (CI) to determine the similarity relationship, that can be utilized to calculate relevant values corresponding to item similarities, probability or likelihood related to a recommended item, etc., thereby rendering the system more flexible by enabling a professional in the art to use more than one mathematical equations to compute different values or parameters, which help the recommendation service in making the best product recommendation to the customers using the results associated with those mathematical computations.

Conclusion

Although the following references were not used in this office action, they were highly considered. Applicants are further directed to consult these references for more details.

US Patent 6, 041, 311 to Chislenko discloses a method for recommending items to users using automated collaborative filtering stores profiles of users relating ratings to items in memory. Profiles of items may also be stored in memory, the item profiles associating users with the rating given to the item by that user or inferred for the user by the system. The user profiles include additional information relating to the user or associated with the rating given to an item.

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by the user. Similarity factors with respect to other users, and confidence factors associated with the similarity factors, are calculated for a user and these similarity factors, in connection with the confidence factors, are used to select a set of neighboring users. The neighboring users are weighted based on their respective similarity factors, and a rating for an item contained in the domain is predicted. In one embodiment, items in the domain have features. In this embodiment, the values for features can be clustered, and the similarity factors incorporate assigned feature weights and feature value cluster weights (See abstract; fig. 2). Furthermore, Chislenko discloses a series of mathematical equations used to determine or calculate, among other things, a similarity between two feature values (col. 13: 31 to col. 19: 30).

Any inquiry concerning this communication from the Examiner should be directed to Jean D. Janvier, whose telephone number is (703) 308-6287). The aforementioned can normally be reached Monday-Thursday from 10:00AM to 6:00 PM EST. If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's Supervisor, Mr. Eric W. Stamber, can be reached at (703) 305- 8469.

For information on the status of your case, please call the help desk at (703) 308-1113.

Further, the following fax numbers can be used, if need be, by the Applicant(s):


After Final- 703-872-9327

Before Final -703-872-9326

Non-Official Draft- 703-746-7240

Customer Service- 703-872-9325

JDJ
07/12/04


Jean D. Janvier
Patent Examiner
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